

REMARKS

By the present amendment, dependent claims 2, 3 and 6 have been amended to correct their dependency. In addition, dependent claim 13 has been added to further clarify the concepts of the present invention. Support for the subject matter of this newly added claim may be found, among other places, in Example 1 and the disclosure at lines 19-20 of page eight of the specification. Entry of these amendments is respectfully requested.

Claims 3, 4 and 6 were objected to as being dependent upon cancelled claim 2. As mentioned above, these claims have been amended to correct their dependency by now being dependent upon claim 1 only.

In the Office Action, claims 1 and 3 were rejected under 35 USC § 103(a) as being unpatentable over the previously cited '055 patent to Arai et al in view of the newly cited patent to Mukoyoshi et al. In making this rejection, it was asserted that cited Arai et al patent teaches an ink jet recording sheet of the structure as claimed including the value of surface roughness as recited. It was acknowledged that the Arai et al patent does not teach (a) the recited surface glossiness value and (b) a base support impregnated with a pigment component. As to the former (a), it was asserted that the disclosed recording sheet inherently has this property as presently claimed.

As to the latter (b), the patent to Mukoyoshi et al was asserted to provide this teaching deficiency. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

Before discussing the subject Action in detail, it may be of assistance to differentiate between the concepts of waviness and roughness with regard to recording sheets. More particularly, the attention of the examiner is directed to Fig. 1 of JIS B0601 which was enclosed with applicants' Request for Reconsideration dated September 20, 2002. Specifically, when a sheet has waviness illustrated in Fig. 1(a) therein, its roughness is measured by excluding the waviness. Thus, if sheets have a waviness different from each other, their roughness may be the same. Furthermore, it is clear that fabrics have waviness much larger than papers.

Enclosed with the subject Amendment is a sample of an ink jet recording sheet in accordance with the present invention, the sample demonstrating that the ink receiving side has a stereoscopic feeling. Example 1 of the present application used a fabric comprising yarns having a diameter of 100 μm as a support. It is apparent that such a fabric has waviness much larger than paper supports ordinarily used. As was mentioned above, roughness is measured without considering waviness. Therefore, even when the roughness of respective sheets are nearly the same or equal, waviness may be significantly different. Accordingly, the allegation made in

the subject rejection with respect to nearness of roughness is entirely groundless.

Turning now to the art cited in the subject rejection, it is submitted that the Arai et al patent does not teach or suggest the presently claimed invention. Moreover, particularly, the Arai et al patent states at column 5, lines 26-47, and column 3, lines 36-47 as follows:

3 / 38-53
"The use of such a specially prepared image-receiving sheet involves further problems. Very often the conventional sheet has a very flat surface, or on the contrary it has a very porous surface according to the printing process in use. In particular, since many of the conventional thermal transfer image-receiving sheets have on base sheets dye- or ink-receiving layers and releasing layers formed by wet-coating so that such dye- or ink-receiving layers are excessively flat and glossy. That is, usually the dye- or ink-receiving layers have a surface roughness Ra in the range of 0.2-0.4 and a ten point average roughness in the range of 1.5-2.0 as measured in accordance with JISB 0601-1994. Thus, it is difficult to write on such a flat surface with a common writing instrument such as a pencil, fountain pen or ball-point pen. It is also difficult to obtain a grayed printed image having a feeling of quality."

5 / 37-47
"The invention provides an image-receiving sheet for recording with ink or dye which comprises a base sheet and a resin layer thereon comprising a powdery coating composition which contains a resin component as a dye- or ink-receiving layer. That is, the image-receiving sheet for recording of the invention is produced by dry-coating a powdery coating composition which contains a resin component on a base sheet by an electrostatic spraying process, and then heating, melting and fixing the powdery coating composition thereon to form a resin coating or film as a dye- or ink-receiving layer."

As is apparent, the Arai et al patent is directed to an image-receiving sheet having a resin coating formed by melting. In distinct contrast, the presently claimed invention

relates to an ink jet recording sheet which is porous and produced by wet coating.

Therefore, the ink jet recording sheet according to the present invention is clearly different from the product according to the Arai et al patent in this important respect.

The Arai et al patent also states as follows:

"The thermal transfer image-receiving sheet for recording of the invention has a receiving layer which is comprised of a resin coating or film and has a surface of which arithmetic mean roughness Ra is in the range of 0.1-4.0, preferably in the range of 0.5-4.0 and ten point mean roughness Rz is in the range of 0.5-20.0, preferably in the range of 3.0-20.0, as measured in accordance with JIS B 0601-1994. The thermal transfer image-receiving sheet of the invention, therefore, has a moderate unevenness or undulation of the surface.

The thermal transfer image-receiving sheet of the invention thus has a so-called matted surface and forms a thermal transfer image having a feeling of quality. Besides, a common writing instrument such as a pencil, ball-point pen or fountain pen writes well on the sheet.

When the last sheet has a surface roughness smaller than the above-mentioned, the surface is close to that of the conventional thermal transfer image-receiving sheets and has gloss. On the other hand, when the sheet has a surface roughness larger than the above-mentioned, the surface is excessively uneven or undulating so that when an ink sheet is attached under heat to the thermal transfer image-receiving sheet to transfer the dye or ink on the ink sheet to the thermal transfer image-receiving sheet, the resulting image is of inferior quality on account of lack of uniform contact between the sheets."

Therefore, the Arai et al patent is not concerned with large unevenness such as unevenness formed by thick fibers of a fabric as in the present invention. In this connection, the present specification, page 13, lines 20-24, states as follows:

"Since the ink receiving layer using gas phase method silica can form a film which has high transparency and retains the feeling of the support and can give gloss, glossy feeling and stereoscopic feeling expressed by unevenness of weaves can be obtained."

Combined with DeMatte to reach the use of fused silica
Such a glossy feeling or a stereoscopic feeling expressed by unevenness of weaves is not at all disclosed or suggested by the Arai et al patent.

Further, the Arai et al patent discloses as follows:

"The green layer of the coating composition can be formed so as to have a desired thickness by adjusting the number of layers of the coating composition used according to the mean particle size thereof. Usually the green layers are formed in from two to ten layers.

12/6-13
As described above, even if a base paper which has an uneven or undulating surface at least of $10\mu\text{m}$ in height (vertical distance between the highest portions and the lowest portions of the surface base sheet), in particular, from $10\mu\text{m}$ to $100\mu\text{m}$ in height, the unevenness or undulation of the surface can be offset or compensated, or reduced or decreased by forming a receiving layer as mentioned above on the base paper."

In distinct contrast, page 5, line 22 to page 6, line 4 of the subject specification states as follows:

"The greater unevenness of the surface of the ink receiving layer is naturally preferred because the stereoscopic feeling is more accentuated, but too great unevenness causes deterioration of print density in ink jet recording. The inventors have investigated this point and, as a result, it

has been found that the stereoscopic feeling of the surface of the ink receiving layer and the print density can be balanced by using a fabric as a support and setting the arithmetical mean roughness of the ink receiving layer at not more than $30\mu\text{m}$."

included Arai's limitation

Thus, in accordance with the concepts of the present invention, a stereoscopic feeling is attained by utilizing unevenness of weaves. Such technical concept of the present invention is entirely irrelevant to the Arai et al patent wherein the unevenness or undulation of the surface is offset or compensated.

It is submitted that the above noted teaching deficiencies of the Arai et al patent are not supplied by the patent to Mukoyoshi et al. This latter patent was merely cited for allegedly teaching a base support impregnated with a pigment component. The Mukoyoshi et al patent does not teach or suggest the important features of the subject ink jet recording sheet as discussed in detail in the foregoing.

Accordingly, withdrawal of the rejections under 35 U.S.C. § 103(a) and allowance of claims 1 and 3 over the cited patents are respectfully requested.

Claims 6, 7, 9 and 10 were rejected under 35 USC 103(a) as being unpatentable over the patent to Arai et al further in view of the patent to DeMatte and the Aerosil/Degussa website. Although the initial statement of the rejection did not cite the Mukoyoshi et al patent, the discussion did reference this patent. Thus, it was

presumed that the above Mukoyoshi et al patent was intended to be cited in this rejection.

In making this rejection, the Arai et al and Mukoyoshi et al patents were applied as above and it was asserted that the DeMatte patent teaches the inclusion of fumed silica of all the characteristics as claimed. The website citation was apparently for teaching the specific properties of the silica used by the DeMatte patent. It was concluded that it would be obvious to include the fumed silica according to the DeMatte patent in the recording sheet as taught by the Arai et al and Mukoyoshi et al patents. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

The above remarks relative to the teaching deficiencies of the Arai et al and Mukoyoshi et al patents as developed above with respect to the first rejection are reiterated with regard to this rejection. It is submitted that the teachings of the secondary DeMatte patent and the website do not supply these teaching deficiencies.

Accordingly, withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claims 6, 7, 9 and 10 over the cited patents are respectfully requested.

Applicants acknowledge with appreciation the indication that, as indicated on



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page six of the Action, claims 4, 5, 8 and 11 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In view of the foregoing, it is submitted that the subject application is now in condition for allowance and early notice to that effect is earnestly solicited.

In the event this paper is not timely filed, the undersigned hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit Account No. 01-2340, along with any other additional fees which may be required with respect to this paper.

Respectfully submitted,

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